

INVESTIGATING HOW CERTAIN NUTRIENTS CONTRIBUTE TO INSULIN RESISTANCE

With grant support from the American Diabetes Association, NRI faculty member Wenhong Cao, M.D., is investigating how certain nutrients contribute to insulin resistance, a precursor and key component of Type 2 diabetes mellitus (T2DM), obesity, metabolic syndrome, cardiovascular disorders, non-alcoholic fatty liver disease, dementia and some cancers (breast cancer, colon cancer and prostate cancer). The goal of Dr. Cao's research into insulin resistance is to discover new ways to prevent and treat these diseases and help people achieve optimal health through individualized nutrition solutions.



Dr. Cao joined the NRI in 2012 as a Research Associate Professor after moving his research program from the main campus of the University of North Carolina at Chapel Hill. At the NRI, Dr. Cao is studying the mechanisms of insulin resistance in cellular, molecular and animal models.

After food is consumed, the pancreas releases various digestive enzymes that break down carbohydrates, proteins, and fats, and then converts them to glucose (sugar), amino acids, and free fatty acids that

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ABOUT THE NRI

The University of North Carolina at Chapel Hill's Nutrition Research Institute has a bold mission: to develop the field of individualized nutrition. As we unravel why people have different metabolism and nutrient requirements, we are able to discover nutrition-based solutions to overcome some of our greatest health challenges.



FROM THE DESK OF STEVEN ZEISEL, M.D., PH.D.



Many voices are clamoring for attention in the field of nutrition. Some are real experts like our scientists at the NRI. Others are simply individuals who believe in and promote a particular supplement or diet.

Rarely can nutrition be reduced to a one-size-fits-all recommendation. Nutritional requirements vary because people have different genetic and environmental backgrounds, metabolism and behaviors.

Our goal at the NRI is to encourage people to be better-informed nutrition consumers by understanding the sources of the information they receive. Who's giving out nutrition information? What empirical evidence are they offering to support their claims? It's prudent to be skeptical of broad claims such as: "This dietary premise works for everyone, all the time."

To mitigate the "noise" surrounding nutrition information, the Federal Drug Administration (FDA) recently proposed changes to nutrition facts labels on food packaging. As a practical matter, calories listed will more realistically reflect the amount people eat as a typical serving. For example, a new serving size might be 1-cup of ice cream instead of ½-cup.

The FDA also proposes adding the nutrient choline to its list of essential vitamins and minerals that can be voluntarily declared on nutrition facts labels. My own decades-long research on choline validates the importance of this nutrient to overall health.

Our researchers at the NRI are working every day to understand why metabolism and nutrient requirements differ from person to person, and to discover nutrition-based solutions that will alleviate health problems on a global level. Our mission to make the world a healthier place!

We hope that you'll support us on this journey of discovery and consider partnering with us with a gift to the NRI at www.uncnri.org/SupportUs.

TOP 10 REASONS TO GIVE

1 The NRI is creating a healthier tomorrow for people around the world. At the NRI, our scientists are studying why people differ in metabolism and nutrient requirements and are discovering nutrition-based solutions to prevent or treat heart disease, cancer, diabetes and obesity.

2 The NRI is becoming the next great center for scientific discovery. We offer the opportunity for donors to experience firsthand the growth of a world-renowned center for nutrition research. We intend to join the ranks of exceptional institutions known for scientific breakthroughs and make the Nutrition Research Institute (NRI) the best in the world.

3 NRI faculty members are highly ranked. NRI faculty members represent the best minds in their fields. NRI scientists have been awarded over \$26 million in grants and contracts from companies, foundations and the federal government. Additionally, NRI faculty members have been recognized worldwide for their work, earning many prestigious awards.

4 The NRI is developing the field of individualized nutrition. Cutting edge equipment available nowhere else in the world, coupled with breakthrough scientific methods in genetics and metabolomics, make possible a vision of individualized nutrition never before realized.

5 The NRI is training the great scientists of tomorrow. Students working in the laboratories at the NRI gain critical, hands-on training that equips them with important skills and knowledge to pursue careers in the biotechnology industry and life science fields.

6 The NRI delivers a strong return on investment. Staggering health care costs linked to cardiovascular disease, cancer, diabetes and obesity underscore the urgent need for innovative research into the field of individualized nutrition. Investing in scientific exploration will yield nutritional answers that alleviate disease.

7 Investing in the NRI is an excellent way to build a legacy. Your gifts to the NRI represent a shared belief in our bold vision – to develop nutrition based solutions designed to solve some of our greatest health challenges and, most importantly, put these solutions into practice. You can make all the difference and become a driving force in forging a state-of-the-art science center whose impact will be felt for generations to come.

8 The NRI is an economic engine for our region. The NRI is powering the local economy by converting intellectual capital into an economic engine for attracting business opportunities and creating jobs in North Carolina.

9 The NRI is a valued resource for nutrition education. Programs at the NRI are bringing up-to-date nutrition information to people who want to learn more about how diet impacts health.

10 Innovation at the NRI will change the world. Whether you choose to support a student scientist or fund the work of a highly-ranked researcher, your investment in the NRI has the capacity to help people for many generations. Every day is a new chance for us to make the next discovery that will change the world.



DR. MARTIN KOHLMEIER

Teaching Nutrition and Physical Activity in Medical School

Last year, Dr. Martin Kohlmeier, faculty member at the University of North Carolina Nutrition Research Institute (NRI) and Professor of Nutrition, University of North Carolina Gillings School of Public Health, participated as a panel member for the academic conference, "Teaching Nutrition and Physical Activity in Medical School: Training Doctors for Prevention-Oriented Care."

The non-profit Bipartisan Policy Center (BPC), the Alliance for a Healthier Generation (AHG), and the American College of Sports Medicine (ACSM) hosted the event at The Grand Hyatt in Washington, D.C. Dr. Kohlmeier joined a distinguished panel of physicians and other experts to discuss the importance of making nutrition and physical activity education an essential part of the medical school curriculum.

Dr. Kohlmeier is uniquely qualified to address the strong need for nutrition education for medical students and health care professionals. He and NRI Director Steven Zeisel, M.D., Ph.D., developed the Nutrition in



Panel members listening to Dr. Kohlmeier. Photo Credit: BipartisanPolicy

Medicine (NIM) and Nutrition Education for Practicing Physicians (NEPP) modules, the first core nutrition curriculum available online that includes preventive and therapeutic aspects of medical nutrition care for both pre-clinical and clinical education. This free program of instruction brings evidence-based clinical nutrition education to medical students and physicians and prepares them to address nutrition-related health concerns.

Event speakers included former U.S. Secretary of Agriculture Dan Glickman, former Secretary of Health and Human Services Donna E. Shalala, AHG Chief Executive Officer Howell

Wechsler and ACSM Chief Executive Officer Jim Whitehead.

Former U.S. Senate Majority Leaders Howard Baker, Tom Daschle, Bob Dole and George Mitchell founded the Bipartisan Policy Center in 2007. Based in the nation's capital, the BPC promotes bipartisan efforts to address pressing national issues.

To learn more about Dr. Kohlmeier's work in the field of nutrition education, visit www.uncnri.org.

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can be absorbed. The pancreas also releases insulin that helps convert the absorbed nutrients into glycogen, proteins, or fat (triglyceride) as storage. Insulin resistance occurs when insulin cannot drive blood glucose into muscle and fat tissue to be used or stored and cannot efficiently suppress glucose production from the liver, eventually leading to an increased blood glucose level (hyperglycemia), i.e. diabetes.

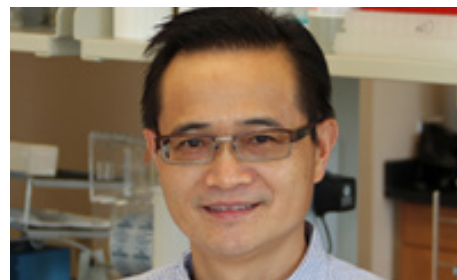
Once insulin resistance is established, T2DM may occur within 10-15 years in some people, and it will dramatically increase the chances of getting hypertension, atherosclerotic vascular disorders (heart attacks and strokes), Alzheimer's disease, cancer, and accelerated aging. Fortunately, insulin resistance can be reversed if insulin resistance is detected early enough and appropriate measures such as diet and physical exercise are implemented. In other words, insulin resistance and its many associated health problems are largely preventable and reversible.

Dr. Cao says that it's important to maintain a good energy balance: "Don't eat more than the body needs (it's even better to eat a little less than your body needs, if you can), get sufficient exercise to burn calories, and eat healthy unprocessed foods."

As a result of his continuing research at the NRI, Dr. Cao recently opened JC Med, a start-up company located in a ready-to-go lab on the North Carolina Research Campus (NCRC) in Kannapolis. His company is developing a dietary supplement to reduce insulin resistance. Dr. Cao advocates early education and intervention with children to help them understand the relationships between the foods they eat, their weight and how to stay healthy.

His research confirms that everyone is affected in some way by the problem of insulin resistance.

"Are you at your optimized condition or could you be better? Optimal health can improve your life and your future."



Dr. Cao received his medical degree and completed his residency training at Hunan Medical University in Hunan, China. He served as Associate Professor in the Department of Internal Medicine there. He later joined Duke University and became an Associate Consulting Professor in Internal Medicine (Endocrinology). Dr. Cao served as Associate Investigator at The Hamner Institutes for Health Sciences. He joined the University of North Carolina at Chapel Hill faculty as Research Associate Professor in the Department of Nutrition in 2011.

For more information about Dr. Cao's research, visit www.uncnri.org.

IN THE COMMUNITY



UNC NRI Appetite for Life SEMINAR SERIES

SEMINAR SERIES SET FOR APRIL 1, 8, & 22

This year the popular Appetite for Life Academy, hosted by the NRI, is scheduled for April 1, 8 and 22. The series will be held at 7 p.m. at the David H. Murdock Research Institute on the North Carolina Research Campus in Kannapolis.

Experts in the field of nutrition will present the latest in scientific research to the community through educational and interactive programs. Sponsors of the 2014 Appetite for Life Academy are Dole and Carolinas Medical Center-NorthEast.

April 1 – Dr. Saroja Voruganti, NRI researcher and assistant professor in the Department of Nutrition, UNC-Chapel Hill, *“Uric Acid: A New Look at an Old Risk Factor for Gout and Cardio-renal Disease.”*

April 8 – Dr. Kyle S. Burger, assistant professor in the Department of Nutrition, UNC-Chapel Hill, *“This is Your Brain on Sugar!”*

April 15 – No lecture due to Easter Holiday/Spring Break

April 22 – Dr. Carol Cheatham, NRI researcher and assistant professor in the Department of Psychology, UNC-Chapel Hill, and Kelly Sheppard, Ph.D. Candidate, Department of Psychology, *“Berries and Brain: Partners in Life and Longevity.”*

The first Appetite for Life Academy was held in 2008. Topics of interest to the community have included metabolism, nutrition and viruses, the global obesity epidemic, and how genetics and diet relate to cardiovascular disease.

Participants commented that Appetite for Life speakers present “practical information that I can use,” and that it is “applicable to my everyday life.”



NRI CELEBRATES 5 YEARS OF RESEARCH IN KANNAPOLIS

NRI Faculty and Staff Reflect on the Past Five Years and Share Aspirations for the Future:

“It has been an honor to have been a member of the NRI for all of the first 5 years. The NRI continues to make not only a local impact, but a global impact, as we grow to full capacity. I am thankful, as a Kannapolis native, to have been a part of the rebirth of Kannapolis’ economy through groundbreaking research and investment in the local community. Kannapolis and the Piedmont region are fortunate to have the University of North Carolina at Chapel Hill’s NRI influencing the nutrition and health of its citizens through our wide variety of community outreach events and vast opportunities for the citizenry to be involved in our research.

Ryan G. Dayvault

*Business Services Coordinator, Facilities & Special Projects Coordinator
Kannapolis City Council Member*

I am proud to say that I have been here from the beginning (or close to it.) I had then and still have the vision for campus. Yes, it is growing more slowly than we had hoped, but who could have predicted the Great Recession? I think we are doing grand given the circumstances of the past 5 years. We are growing every semester with the addition of very interesting, brilliant scientists to our team. It has been a joy to be part of the NRI thus far, and for the future, I predict innovative ideas, cutting-edge projects, and amazing discoveries. Our impact will be felt worldwide once our work is implemented in the general populace. That is, after all, the goal – to do the science that is going to make a difference in people’s lives.”

Dr. Carol Cheatham

Research Scientist



As a little girl, I remember a vibrant Kannapolis made up of the people who worked at Cannon Mills, who lived in its communities, and shopped and dined in its stores and restaurants. As the jobs dwindled and Kannapolis lost some of its spark, I worried about what would become of the town I called home. And now, as an NRI employee, I'm proud to see the Kannapolis community embrace new technology, new economy, and new people, and I am honored to play a small part in helping breathe new life into my hometown.

Brandi Johnson Childers

Office Manager, Human Resources Manager

The UNC Nutrition Research Institute has the potential to become the global leader in the application of nutrition to improve human health. In accomplishing this, we will be transformative in our community by putting Kannapolis, Charlotte and surrounding communities on the scientific map as a key player in taking science from concept to application. We will also impact the health of individuals for generations to come. The UNC NRI also has the potential to provide a boost to our economy by providing jobs. My dream is for our community to take ownership and pride in the UNC NRI to help us in promoting the great work being done here.

Dr. Karen Corbin

Research Scientist

As a Kannapolis native who only moved back once the NCRC was in process, I feel very lucky to be a part of the amazing work that has happened here over the past 5 years. First as a part-time recruiter, then a full-time recruiter/research assistant, and now as lab manager, I have enjoyed sharing with the community the excitement of research and discovery. When we give presentations in the community about our work, people are continually fascinated and impressed. Over those 5 years – with Dr. Cheatham's tireless efforts – we have negotiated the challenges of numerous, different studies involving infants, children and adults. In addition, we collaborated on a study that focused on middle-aged women and completed some work in The Gambia! We have had participants from 17 different counties participate in our research. As I look to the future, I anticipate that the excitement, enjoyment, and challenge of my job will only increase!

Julie Stegall

Lab Manager, Cheatham Lab

I am happy to say that I was one of the people who started working at the NRI from the early days of the institute. I look back with admiration and amazement and I feel proud for being part of its remarkable growth. This would have not been possible without the passion and hard work of the people that had the vision of a unique place like this. They inspired others to come and contribute to the personalized nutrition paradigm, a concept that has the potential to fundamentally change the way we do research.

Daniel Lupu, M.D.

Graduate Research Assistant, Niculescu Lab



NRI SPONSORS 2014 NC SCIENCE FESTIVAL, MARCH 28 - APRIL 13

Get Riveted! with the 2014 NC Science Festival -- more than 500 events to be held throughout the state March 28-April 13.

The NRI is proud to sponsor the festival during its two-week run. The festival currently serves 85 of the state's 100 counties.

The Kannapolis City Schools STEM program will feature activities aligned with Earth Day, focusing on topics of Nutrition, Environmental Concerns and Energy Conservation. KCS students will participate in Keeping Kannapolis Green March 31-April 4.

Other Kannapolis events planned for the NC Science Festival include:

- *The Science of Music, Kannapolis Branch Library, April 9*
- *STEM Open House, Rowan-Cabarrus Community College, April 12*
- *STEM Open House, North Carolina State University Plants for Human Health Institute and A.L. Brown High School, April 12*
- *Science of Baseball, CMC-NorthEast Stadium, April 12*
- *Zucchini 500 Vegetable Race, Stewart-Haas Racing, April 13*
- *Stories Under the Stars "Spin, Pop, Boom!" Kannapolis Branch Library, April 13*
- *STEM in the City, City of Kannapolis Water Treatment Plant, April 16*
- *Things that Glow in the Dark, Kannapolis Branch Library, April 18*
- *Viva Verde Earth Festival, North Cabarrus Park, April 20*
- *Sara Bellum Kits, sponsored by the Cheatham Nutrition and Cognition Lab at the NRI, will be available in the Kannapolis City Schools throughout the event.*

For more information about the 2014 NC Science Festival, visit ncsciencefestival.org.



MEET THE PEOPLE BEHIND THE SCIENCE

SAROJA VORUGANTI, PH.D.

Saroja Voruganti, Ph.D., joined the UNC Nutrition Research Institute in November 2013 as an assistant professor in the Department of Nutrition at the University of North Carolina at Chapel Hill. Dr. Voruganti's long-term research goal is to understand the genetic and environmental factors that affect complex human diseases using a combination of statistical, molecular and bioinformatics (network/pathway analysis) techniques.

JOINED NRI IN NOVEMBER 2013

Her specific interests include: understanding the influence of genetic variants on serum uric acid levels (an indicator for gout, renal and cardiovascular disease); analyzing effects of gene by diet interactions on serum uric acid levels and associated renal-cardiovascular diseases; detecting early biomarkers that contribute to increased serum uric acid or hyperuricemia; and identifying functional markers of these disorders that will lead to novel treatment targets.

Dr. Voruganti earned her B.Sc. degree with honors in Foods and Nutrition at The University of Delhi, India, and a post-graduate diploma in Dietetics and Hospital Food Service. She received a Ph.D. in Nutritional Sciences from the University of Texas at Austin and did post-doctoral work in Genetic Epidemiology at the Texas Biomedical Research Institute.

Her post-doctoral research has included several studies involving minority populations such as Mexican Americans, American Indians, Western Alaska Natives and Hispanic children. Her focus in all these studies is to understand genetic and environmental influences on renal-cardiovascular disease risk.

Dr. Voruganti has published or has in press more than 70 scholarly papers and has authored chapters in two books:

Handbook of Anthropometry: Physical Measures of Human Form in Health and Disease and Human Variation: From the Laboratory to the Field.

She received the New Investigator Research Award from The Obesity Society in 2007. In June 2012, the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health (NIH) awarded Dr. Voruganti a grant to research the effect of variants in uric acid transporter genes on serum uric acid levels as well as other renal-cardiovascular risk factors in Mexican Americans and American Indians. She is currently establishing a study in another minority and genetically isolated population, Parsi Zoroastrians, to identify genetic variants affecting the risk for cardiovascular disease.

Looking to the future, Dr. Voruganti will continue to investigate the genetics of variation in renal and cardiovascular phenotypes and identify functional variants that can prove to be therapeutic targets for these diseases along with the role of diet or nutrients in modifying an individual's risk or susceptibility to these diseases.

For more information about Dr. Voruganti, or to schedule an interview, please contact the UNC Nutrition Research Institute at 704-250-5009.

/INTHE SPOTLIGHT/



ACCOUNTING TECHNICIAN JOSEPH SQUIRES

plays an essential role at the NRI with responsibility for all accounting functions: accounts payable, accounts receivable, invoicing and reimbursements for UNC-Chapel Hill. After retirement from the United States Air Force, this veteran made a career change that ultimately led him to employment here.

Tell us a little about yourself and your military service.

I am originally from New Bern, NC. I'm married to Kimberly and have three

children -- Teanna, Joseph III and Symira. My hobbies are playing golf, working out and reading African American history.

I started my Air Force career as an aircraft engine mechanic and ended my career as the superintendent of the Evaluation and Inspection Team. This involved working with FEMA to stage anti-terrorism and natural disasters scenarios in order to evaluate military and civilian first responders. I spent 10 years of my career overseas in foreign countries including Italy, Japan, Korea, Saudi Arabia, Israel, Sicily, Spain, Germany, Turkey, Guam, Hawaii, the Philippines, France, Greece, England and Iraq.

Joseph retired from active duty in 2007 so that he could devote more time to his family. They moved to Concord where Joseph worked with Habitat for Humanity-Cabarrus County as Director of ReStore Operations with responsibility for the ReStore on North Cannon Boulevard, the recycling program, ReStore volunteers and gift-in-kind donations.

What was your path to employment at the NRI?

After I was laid off in August 2010, I immediately went back to school. I earned my Bachelors of Science degree in Accounting in December 2012 and was hired by the NRI in May 2013. I've always enjoyed working with money and while in the Air Force would create budgets and offer financial advice to anyone who needed help. After my first accounting class, I knew it was what I wanted to do.

What do you enjoy about working here?

I really enjoy the people I encounter every day and the diversity of people that work here. I'm also excited to be a part of the research and discoveries that can happen here.

My future aspirations are to establish my own accounting practice and to find a way to participate in increasing financial literacy in the area.

/NEW Post-doctorates, Lab & Support /



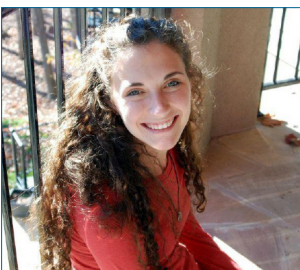
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/ **NEW** Post-doctorates, Lab & Support /



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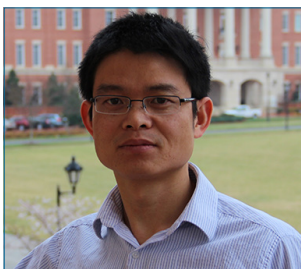


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